State of Missouri

Final Order of Rulemaking
10 CSR 20-7.031
Water Quality Standards

Missouri Department of Natural Resources
Division of Environmental Quality
Water Protection Program

September 9, 2005

Title 10—DEPARTMENT OF NATURAL RESOURCES
Division 20—Clean Water Commission
Chapter 7—Water Quality

ORDER OF RULEMAKING

By the authority vested in the Missouri Clean Water Commission (commission) under section 644.026, RSMo 2000, the commission amends a rule as follows:

10 CSR 20-7.031 is amended.

A notice of proposed rulemaking containing the text of the proposed amendment was published in the *Missouri Register* on May 2, 2005 (30 MoReg 843-974). Those sections with changes are reprinted here. This proposed amendment becomes effective **December 31, 2005**.

SUMMARY OF COMMENTS: A public hearing on this proposed amendment was held July 6, 2005, and the public comment period ended July 14, 2005. Comments made at the public hearing and during the public comment period are presented here followed by the department's response.

1-Definitions

COMMENT #1-1: Comments support clarification of acute and chronic criteria.
RESPONSE #1-1: The rules will continue to contain acute and chronic criteria. Further clarification on the application of these criteria may be reviewed in future rulemakings.

COMMENT #1-2: Definition of Water Hardness should consider effluent hardness in determining seasonal and effluent mixing conditions.
RESPONSE #1-2: When used in establishing water quality standards, water hardness relates to the ambient (natural) quality of the receiving water body. The standard would not represent the natural condition of a surface water if the influence of effluent hardness is considered. Usually, effluent has much higher hardness than surface water because it contains compounds of calcium, magnesium, and a variety of other metals. Consequently, if the effluent is considered in determining hardness, the resulting effluent metal limits will be less stringent and will allow for adding higher loads of metals to the water body, that will in turn increase its hardness and further degrade water quality of the receiving water body.

COMMENT #1-3: Revise definition of whole effluent toxicity (WET) tests.
RESPONSE #1-3: This is a new issue that was not part of the purpose of the current proposed revisions, but may be discussed with stakeholders and possibly addressed in future rulemakings.

2-Classification of Waters of the State

COMMENT #2-1: All waters of the state should be classified.
RESPONSE #2-1: The department recently received approval from the Clean Water Commission on a procedure for classifying waters. The department must follow that procedure until the procedure is modified through the Commission. Nevertheless, the department's goal is to protect all waters of the state. And under the current classification procedure, waters are classified when the action is necessary to provide protection to beneficial uses on or in the water. Furthermore, until these uses are identified through classification, the unclassified waters are protected under general (narrative) criteria.

COMMENT #2-2: All lakes owned or controlled by governmental entities should be waters of the state and all standards applied.
RESPONSE #2-2: The proposed definition of "waters of the state" (WOTS) as it appears in 10 CSR 20-7.031(1)(Y) results in all lakes in Missouri that are owned or controlled by government entities falling within the definition of WOTS. The standards for these waters shall be determined through the identification of existing uses on or in these waters.

COMMENT #2-3: Man-made drainage ways, which covers the entire bootheel, are not rivers, streams, or creeks; they are storm water drains. These should be considered under a different category than rivers, streams, or creeks.
RESPONSE #2-3: Several waters in the bootheel are classified and have designated uses. Being classified, they are subject to a designation for whole body contact recreation until a Use Attainability Analysis (UAA) shows the use is unattainable. Man-made drainage ways can be limited in their capacity to support certain uses and might qualify through a UAA for a modified use designation or alternative standards to account for those limitations.

COMMENT #2-4: Harper Hollow Creek in Camden county should be listed as a Class P water. The creek has maintained a permanent flow since 1953, sufficient to operate a hatchery operation, catfish farm, and maintain aquatic life.
RESPONSE #2-4: This is a new issue that was not part of the purpose of the current proposed revisions, but may be discussed with stakeholders and possibly addressed in future rulemakings using the classification procedures as approved by the Commission.

3-Criteria for Whole Body Contact Recreation (WBCR)

COMMENT #3-1: Comments supported the proposed tiered recreational uses (Category A and B) and criteria associated with those uses. Other comments support additional recreational use refinement in the future by designating additional subcategories of use such as a subcategory for waters receiving combined sewer overflows. One comment states that the way the department has attempted to assign

the Class B recreational uses does not meet the goal of the Clean Water Act Section 101(a)(2).
RESPONSE #3-1: Further revisions to the designations may be evaluated in future rulemakings once specific information is presented that promotes a different approach. Until then, the two tiered categories of Whole Body Contact Recreational (WBCR) use and the corresponding criteria appear to be appropriate designations for the WBCR use and are retained in Final Order of Rulemaking.

COMMENT #3-2: While the cost to disinfect water which may never be used for recreation is an obvious consequence to disinfection, the need to dechlorinate, the production of trihalomethanes, and the inability to utilize alternative methods where high suspended solid levels exist all drive the cost of treatment upward and in many cases will not provide any additional benefit.
RESPONSE #3-2: The department recognizes that the costs to comply with the new standards will be significant in some cases. The department may make special arrangements to promote compliance while preventing unnecessary burdens. Options available to avoid these unnecessary burdens include modifying or rescinding standards through UAAs, developing a compliance schedule that allows for extra time to design, build and implement new pollution control measures, obtaining a temporary variance through the Clean Water Commission or entering into an administrative or enforcement agreement that provides additional time.

COMMENT #3-3: Missouri's original methodology, which allowed any party to add recreational waterways to the list of Missouri's classified streams, properly addressed the recreational waterway situation, placed the burden of determination and review upon the state, and allowed reasonable time for parties to be involved in the financial risk to assess their situation.
RESPONSE #3-3: Missouri's original methodology for select designation of waters for whole body contact was determined by USEPA to be inconsistent with the federal Clean Water Act. In order to have a water quality standards program acceptable to USEPA, Missouri must designate and protect all classified waters for a swimming use, until it can show the use is not attainable.

COMMENT #3-4: Some activities where whole body contact may be a concern is during scientific surveys where individuals snorkel and collect aquatic life, activities of citizen groups to clean and monitor water quality, and hand fishing.
RESPONSE #3-4: The department will apply the appropriate bacterial standard to protect these uses. If snorkeling, or any other form of recreational use, is occurring in waters less than the qualifying depth specified in the UAA protocol, than the department must rely on evidence of that use to be presented and documented during the performance of a UAA or during the public comment period on the UAA.

COMMENT #3-5: Waters designated for whole body contact recreation category B (WBCR-B) should be upgraded to whole body contact recreation category A (WBCR-A) only if supported by a structured and scientific study demonstrating that

increased protection is appropriate. Clarification is requested in the definitions of WBCR-A and WBCR-B.
RESPONSE #3-5: Evidence obtained as part of a UAA and/or the public's input on the UAA can provide for the removal of whole body contact use or a redesignation to either subcategory WBCR-A or WBCR-B. The UAA protocol and the definitions of the use categories are sufficiently clear to achieve an understanding of the eligibility for the use designations.

COMMENT #3-6: The following sentence should be removed from Section (1)(C)8. "All waters in Tables G & H of this rule are designated for whole body contact recreation." The use designations in Tables G & H are self-explanatory. After UAAs have been approved, it is possible that some waters in Tables G & H may not be designated for whole body contact recreation, resulting in potential inconsistencies with this statement.
RESPONSE AND EXPLANATION OF CHANGE #3-6: Revising the sentence would improve the rule. The rule has been rewritten to read: "All waters in Tables G and H of this rule are presumed to support *[designated for]* whole body contact recreation until a Use Attainability Analysis (UAA) has shown that the use is unattainable. The use designation for whole body contact recreation may be removed or modified through a UAA for only those waters where whole body contact is not an existing use." The final Order of Rulemaking reflects this change.

COMMENT #3-7: Recommend all or most lakes be placed in WBCR Category A.
RESPONSE #3-7: The current designations for WBCR Category B are appropriate when considering the public's lesser accessibility and less frequent use, and therefore less risk level, in water bodies designated as such. Should evidence be provided in the future that a particular lake qualifies under the definition of a WBCR-A designation, the department may change the designation at that time to reflect the greater use at that lake.

COMMENT #3-8: Revise the text in 10 CSR 20-7.031(1)(C)8 to state that whole body contact recreation may be removed or modified through a UAA for only those waters not identified as having whole body contact as an existing use.
RESPONSE AND EXPLANATION OF CHANGE #3-8: The structure of a UAA does not allow for existing uses to be removed. The Recreational Use Attainability Analysis Protocol (p.10) states that existing uses cannot be removed unless substituted for another use that has water quality criteria as stringent or more stringent than the original use. Federal requirements also require existing uses to be retained. While adding the suggested text to paragraph 8 would not appreciably change the existing rule, the change may help emphasize an important point. Therefore, the suggested language was added.

COMMENT #3-9: All streams within the boundaries of Ozark National Scenic Riverways should be designated for whole body contact since visitors have a reasonable expectation to find any stream in the park to be "fishable/swimmable." The standard in these streams should be no degradation from natural background

levels, which are much lower than the proposed standards for both categories. Another similar comment stated that the proposed bacterial standards are above the natural background levels in the Outstanding National Resource Waters (ONRWs) and therefore do not represent the antidegradation rule. Site-specific standards should be developed for the ONRWs (such as what was done in the Jacks Fork River TMDL) and those standards should be incorporated into rule.
RESPONSE #3-9: No new or expanded releases are allowed into the watershed of the Ozark National Scenic Riverways or any other ONRW. This prohibition eliminates the allowance for any degradation of these special streams from their current quality.

COMMENT #3-10: Of the several large springs managed by Ozark National Scenic Riverways, only Alley Spring is classified under the proposed rules and it is assigned to category B. Most visitors assume that the water issuing from these springs are of the highest quality, and that is often true, but the importance of protecting springs is not reflected in the Water Quality Standards.
RESPONSE #3-10: At this time, the department is not aware of any recreational uses within the waters at Alley Spring that qualifies that spring for Category A. However, within the water quality standards, the losing streams, which are often connected to springs, are protected against bacteria influences by having the same standard as whole body contact Category A. Therefore, while springs and their branches have not always been listed in the standards, they are likely receiving a higher level of protection through the groundwater standards. As the department receives information regarding the recreational uses within springs, it will propose their classification with appropriate use designations.

COMMENT #3-11: The department should develop an approach to WBCR use designations that considered the socio-economic impact on communities.
RESPONSE #3-11: Socio-economic impacts can be considered as Criterion 6 of the Recreational Use Attainability Analysis Protocol. Any community that believes that the designation of whole body contact (in areas without an existing use) would cause substantial widespread social and economic impact, a use attainability analysis is a possible option for seeking an alternative standard.

4-Criteria for Secondary Contact Recreation (Boating and Canoeing)

COMMENT #4-1: Numerous areas have recreation that can be classified as secondary contact. In areas where whole body contact recreation is limited or unattainable because of natural reasons, a designation of secondary contact recreation may be more than adequate to protect recreational boating, canoeing, kayaking, and other limited contact recreational activities. The standards to protect secondary contact recreation will provide significant protection in waters where waters do not support whole body contact recreation (WBCR).
RESPONSE #4-1: WBCR is a separate designated use from secondary contact recreation (SCR) and each should be separately assessed and applied to waters independently. A water body that does not have WBCR use should not be

automatically assumed to support SCR. Also, a WBCR use designation on a water segment does not justify the designation of SCR to the water segment. WBCR, until proven by a use attainability analysis, will be applied to all classified waters to satisfy the presumption required by the federal Clean Water Act. SCR will be designated as evidence is presented that demonstrates those activities are occurring in the water segment.

COMMENT #4-2: Support is given for the replacement of the beneficial use title "Boating and Canoeing" with "Secondary Contact Recreation." It is also appropriate to recognize a lower tier of protection for streams that only pose a risk of incidental or accidental contact where the probability of ingesting water is minimal.
RESPONSE #4-2: This proposed change to the definition title appears in the Final Order of Rulemaking.

COMMENT #4-3: No water should be designated for secondary contact recreation and this entire section should be removed. Secondary contact recreation is recreation in and on the water. All waters should be designated for whole body contact recreation.
RESPONSE #4-3: All classified water will be designated for whole body contact, unless evidence presented in a use attainability analysis successfully rebuts that presumption. See RESPONSE #4-1.

5-Use Attainability Analysis (UAA)

COMMENT #5-1: Use Attainability Analyses (UAAs) on 396 stream segments were submitted to the Clean Water Commission. The commission reviewed the UAAs and comment on the UAAs.
RESPONSE AND EXPLANATION OF CHANGE #5-1: The following conclusions were made: 133 waters are unable to support a whole body contact recreational use and 10 waters are able to support the WBCR use on certain segments. Table H was revised to reflect where UAAs found the WBCR use as unattainable on the 133 full stream segments and the 10 partial stream segments. The designation of WBCR was retained on all other classified streams where the WBCR use was determined attainable by a UAA or, if no UAA was performed, presumed to be suitable for WBCR.

COMMENT #5-2: Defining what constitutes an existing beneficial use, particularly existing recreational uses, is needed, and the definition should be consistent with those of the Clean Water Act. Federal regulations (40 CFR 131.3) define an "existing use" as "those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the water quality standards." Another comment recommends that Missouri either adopt by rule or formal policy that "existing uses" are established by demonstrating that a frequent and recurring use has actually occurred and the water quality required to protect those uses have actually been attained since November 28, 1975. This definition is

similar to that found in the State of Rhode Island's water quality standards. An additional comment noted that the UAA process assumes that stream use and conditions in 1975 and ensuing years are the same today. Many northern Missouri streams have been channelized. Another comment stated that uses that existed before November 28, 1975 should be protected.
RESPONSE AND EXPLANATION OF CHANGE #5-2: Adopting a definition for "existing use," as well as "designated use," would be beneficial toward ensuring a consistent understanding between the two phrases. The department is adding these definitions as it appears in the federal rule as well as in the Recreational Use Attainability Analysis protocol.

COMMENT #5-3: The provisions regarding recreational use can be distorted under the present theories resulting in an inappropriate designation of many waters for whole body contact. This will result in UAAs not being approved based on false recreational data.
RESPONSE #5-3: The department relied on interviews or comments about recreational uses only when depth of the stream was less than the criterion established for use. While no absolute certainty can been achieved through interviews, the potential for false reports should be minimized by requiring that the interviews include descriptions on the type of recreational activity taking place, location and frequency of the activity, and the season or time period the activity took place.

COMMENT #5-4: A major effort using government staff and funds was launched to conduct UAAs, yet little to no effort was being made to notify members of the public who live along the streams at issue. Public comments and interviews with those living along affected streams were never made a priority.
RESPONSE #5-4: Although not required by the UAA protocol, interviews were conducted on some occasions. Where interviews were not possible because of time constraints, the department relied on careful observations for evidence of use. The publication of the completed UAAs on the web site for public comment also resulted in some new information. The public notice of the UAAs was sent statewide. For the most part, the comments received confirmed the accuracy of the UAA findings. The department received information contrary to the staff findings on only a small percentage of the UAAs.

COMMENT #5-5: Information already collected by the department through stream surveys and volunteer water quality monitoring should be considered before the department recommends removing recreational uses.
RESPONSE #5-5: For any data to be used to remove a recreation use designation, they must satisfy the criteria outlined in the UAA protocol. Most of the data collected during stream surveys and monitoring does not compliment the data required for a use attainability analysis. Most of these surveys are focused on protection of aquatic life and assessing the general water condition. If depth measurements are taken, most are located in runs or other wadable areas, and not areas likely to support swimming.

COMMENT #5-6: The depth criterion alone is not an adequate basis to remove recreational designations. The depth of a stream is not an automatic gauge of whether or not people use it for recreation. Physical characteristics of a stream are not even supposed to be used to determine attainability of recreational uses [see Water Quality Standards Handbook, p.2-3 (U.S. EPA 1994)].
RESPONSE #5-6: Under federal regulations at 40 CFR 131.10(g)2, states may remove a designated use which is not an existing use if attaining the designated use is not feasible because of natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the use. The Water Quality Standards Handbook, as referenced above, states that swimming and/or wading may occur regardless of depth. The handbook goes on to say that the state must set criteria to reflect recreational uses if it appears that recreation will in fact occur in the stream. Whole body contact recreational uses have been and will continue to be designated for areas where recreation has been observed, regardless of the depth.

COMMENT #5-7: UAAs should not result in use removal because of lack of past use. The lack of use may be attributed to high bacteria counts, which if human related, should be addressed.
RESPONSE #5-7: Lack of use in areas with sufficient depth to support whole body contact recreational (WBCR) use was not a determining factor in the department's decision. If an area had adequate depth to support WBCR, then the use was retained. If an area lacked depth and did not show any evidence of use, the WBC use designation was removed.

COMMENT #5-8: A comment suggested adding the following definition of Use Attainability Analysis (UAA) from federal regulations at 40 CFR 131.3: “a structured scientific assessment of the factors affecting the attainment of the use which may include physical, chemical, biological, and economic factors as described in § 131.10(g).”
RESPONSE AND EXPLANATION OF CHANGE #5-8: A definition for "Use Attainability Analysis" would be beneficial toward ensuring a consistent understanding of the phrase. The department is adding the definition for Use Attainability Analysis (and UAA) as it appears in the federal rule as well as in the Recreational Use Attainability Analysis protocol.

6-Aquatic Life Criteria

COMMENT #6-1: The definition for the protection of aquatic life (general warm-water fishery) is confusing and isn’t interpreted consistently. The comment suggests an alternative definition. All fish and aquatic life are important ecologically and recreationally in lakes, creeks, and streams of Missouri. Some waters classified as a limited warm-water fishery do have some recreationally important fish species. The higher limits for contaminants provide a toxic effect, therefore limiting the aquatic fauna in these streams. This comment recommends deletion of the limited warm-water fishery definition or at least a modified definition as suggested.

RESPONSE #6-1: These comments raise a new issue not included in the purpose of this rulemaking or in the regulatory impact report. The department may be considering revisions of designated uses for the protection of aquatic life (general warm water fishery, limited warm water fishery, cold water fishery, and cool water fishery). Future discussions on this issue will be discussed with stakeholders and may be part of the next rulemaking.

COMMENT #6-2: Acute and chronic numerical criteria for protection of aquatic life are listed in the Water Quality Standards and should be mentioned in the text of 10 CSR 20-7.031(4). Add "protection of aquatic life" to the last sentence of the paragraph of this section.
RESPONSE AND EXPLANATION OF CHANGE #6-2: The sentence "Only waters designated for livestock and wildlife watering are considered to be long-term supplies and are subject to the chronic toxicity requirements of the specific criteria" does not provide any more or less protection of the classified waters of the state. All classified waters are protected according to the designated uses assigned to them in Tables G and H, and the criteria associated with each designated use as assigned in Tables A and B. All of the criteria in Tables A and B are chronic values, unless specifically identified as being acute, as stated in subsection (4)(A). Because the last sentence in section (4) has not effect on the standards, the department has deleted this sentence.

COMMENT #6-3: The rules should provide optimal water quality protection by utilizing the flexibility provided by an aquatic life use attainability analyses. The department should propose either an additional tier of aquatic life use protection or redefine limited warm-water fishery to include those waters whose designated use should be downgraded based upon use attainability analysis results. This comments suggests revised language for the limited warm-water fishery definition.
RESPONSE #6-3: This comment raises a new issue that was not included within the purpose of this rulemaking. Therefore, this issue was not discussed in the regulatory impact report that accompanied this rulemaking. See RESPONSE #6-1 for a similar discussion. Further discussion is needed on this topic, and if enough interest is generated, the department may develop an aquatic life use attainability analysis or alternative use designation for aquatic life in later revisions of the water quality standards.

7-Site-Specific Criteria for Wetland Protection

COMMENT #7-1: Site-specific criteria for wetlands should be developed and should consider regional differences in wetlands types. Another comment stressed that many questions should be answered about wetlands before any action is taken.
RESPONSE #7-1: Site-specific approaches, as proposed by this rule, considers, among other parameters, wetland type and regional location. Any site-specific criteria developed through the implementation of this rule will involve public participation. More detailed implementation procedures for this approach may be addressed in future revisions to the water quality standards.

COMMENT #7-2: The development of site-specific criteria for wetlands does not need to be in rule.
RESPONSE #7-2: The Administrative Procedures Act at Section 536 RSMo requires the promulgation of a rule on any departmental procedure, process, method, or any other guidance of general applicability, and may require that site-specific criteria for wetlands be implemented through rule.

8-Use of General Water Quality Criteria

COMMENT #8-1: The following comments were received on the use of general criteria for protecting water quality:

- Supports use of general criteria for protecting unclassified streams.
- Industrial process water must comply with general water quality standards.

RESPONSE #8-1: General criteria apply to all waters including unclassified streams and are stated and enforced as permit conditions in all National Pollutant Discharge Elimination System (NPDES) permits.

9-Site-Specific Criteria for Aquatic Life Protection

COMMENT #9-1: Need specific water quality criteria for channelized or hydrologically modified lakes and reservoirs.
RESPONSE #9-1: The Department recognizes that hydrologically modified water bodies are unique and may not maintain the same species and assemblages of aquatic life as natural water bodies within a similar ecoregion. Criterion 3 of the Use Attainability Analysis (UAA) protocol may be used to determine if changes to the designated uses of a hydrologically modified water body are appropriate. If so, the hydrologically modified water body may qualify for site-specific criteria to reflect the changed use designations. Therefore, the proposed procedures for developing site-specific criteria apply to hydrologically modified waters that have uses altered through a UAA.

COMMENT #9-2: The Department should not delete subsection 10 CSR 20-7.031(4)(A)3, which allows exception to dissolved oxygen (DO) criterion of 5 mg/L until such time as the Department can amend its DO water quality standard to incorporate lower DO levels under specified circumstances.
RESPONSE #9-2: Section (3) of this rule is proposed for deletion because it does not provide a specific implementation protocol. Instead of a blanket low DO standard of 3 or 4 mg/L, the Department proposes procedures for developing DO site-specific criteria based on the specific characteristics of the stream in question. Those procedures are proposed in 10 CSR 20-7.031(4)(R)

COMMENT #9-3: Clarify whether subparagraphs (4)(R)1.A. and B. are conjunctive or disjunctive.

RESPONSE AND EXPLANATION OF CHANGE #9-3: The final Order of Rulemaking contains revised wording to clarify the intention of section (4)(R)I.A. and B.

COMMENT #9-4: Clarify that site-specific criteria may apply to a sub-segment of a classified stream reach.
RESPONSE AND EXPLANATION OF CHANGE #9-4: The Department will consider further segmenting a classified stream when applying site-specific criteria. The final Order of Rulemaking contains revised wording to clarify the possibility of sub-segmentation. In addition, the National Hydrography Dataset (NHD) will eventually replace the existing stream-reach indexing system. NHD provides smaller and more homogeneous stream segments than the current indexing system.

COMMENT #9-5: The use of test species as surrogates may be an acceptable practice in defining the sensitivity of an aquatic assemblage in a stream. Therefore, the fact that a stream has different species than the test organisms may not be a good reason to alter the water quality criteria.
RESPONSE #9-5: EPA's guidance provides for a special recalculation procedure based on species of the families present at the site. The following web link points to more information: http://www.epa.gov/region7/water/sprt.htm.

COMMENT #9-6: Making a full comparison between different streams, even those within the same watershed, is too difficult and will likely not achieve a confident finding on special aquatic life adaptations. Delete the allowance for considering several streams within a watershed as "one site"
RESPONSE #9-6: The allowance to use several streams within a watershed as "one site" is conditional and subject to scientific review. Only streams that have similar aquatic communities and have comparable water quality may be considered one site.

COMMENT #9-7: Several comments addressed the need for developing site-specific criteria for metals and toxics criteria:

- Requests opportunity in the rule to explore site-specific metals criteria, using water effect ratios, and total to dissolved metals translators.
- The methods for determining biological availability of toxics should be broadened to include the use of water effect ratios and translators.

RESPONSE #9-7: The proposed rules are flexible in regard to the methodology for developing site specific criteria. These methods are described in EPA guidance: Water Quality Standards Handbook, Second Edition, 1994 (http://www.epa.gov/waterscience/standards/handbook/). The Department encourages submittals that promote appropriate site-specific criteria, but also encourages coordination with the department early in the process.

COMMENT #9-8: Site-specific criteria development should include the use of a reference stream approach.

RESPONSE #9-8: The rule does not prohibit the use of reference stream approach. If sufficient interest in that approach exists, the department may develop a site specific implementation procedure involving a reference stream approach.

COMMENT #9-9: Revise the definition for Water Effect Ratio (WER) to better clarify the use of this process for determining metals toxicity.
RESPONSE #9-9: WER describes a specific approach that compares the toxicity of a pollutant in actual site water to its toxicity in laboratory water for two or more aquatic species. To deviate from this specific approach would be defining something other than WER. There may exist other comparable and acceptable methods and models to determine site-specific metal criteria, but they are not called WER. Examples are included in EPA guidance. The proposed definition of WER is the original and most descriptive of the procedure and is not intended to limit criteria development to the use of this approach.

COMMENT #9-10: The rule should contain a more detailed procedure for the department to develop site-specific DO criteria.
RESPONSE #9-10: The Department may be further developing a procedure for determining site-specific DO criteria if significant interest exists.

COMMENT #9-11: The rule should contain a reference to the new subsection (4)(R) where language about site-specific criteria is being deleted.
RESPONSE #9-11: The rule should be entirely read in order to understand all available approaches to establishing water quality standards. Adding the references as suggested does not improve the rule and makes the rule unnecessarily lengthy.

COMMENT #9-12: Specific procedures should be in guidance instead of rule. EPA should approve the guidance to avoid having to approve each site-specific criterion. Site-specific criteria should be able to apply to regions and watersheds in addition to individual water bodies. State should discuss with EPA the circumstances in which the use of Cladocerans (a sensitive species) is not appropriate in developing metals criteria.
RESPONSE #9-12: In keeping with section 536 of the Administrative Act, which requires the promulgation of a rule on any departmental procedure, process, method, or any other guidance of general applicability, site-specific criteria may be required as a rule. Whether it is or is not, the Department will solicit stakeholders' input when developing site-specific procedures. Accordingly, the department will discuss the appropriateness of using Cladocerans when developing site-specific criteria for metals.

10-Mixing Zones

COMMENT #10-1: The elimination of the mixing zones on low flow streams does not account for the periods when aquatic life is not present in the stream.
RESPONSE #10-1: Mixing zone allows for effluent attenuation (natural reduction of pollutant effects on aquatic life) within the stream. Streams with a 7Q10 of less than

0.1 cubic feet per second, have no significant capability to attenuate any effluent at this flow. However, they might maintain pools to support aquatic life during most of the year. When evidence indicates the presence of aquatic life, the mixing zone is not allowed. Where aquatic life naturally exists within the receiving stream, the discharge must meet aquatic life standards at the first location within the stream that can sustain life. In some cases, the effluent itself may establish conditions suitable to attract and support aquatic life. However, the department will convene future discussions on streams created by effluent and does not intend for this rulemaking to establish those standards at this time.

COMMENT #10-2: Opposes the deletion of the mixing zone on low-flow Class C streams.
RESPONSE #10-2: Class C streams with a 7Q10 of less than 0.1 cubic feet per second do not provide significant attenuation of the effluent that would make a difference in effluent concentration. Should a study be presented to show otherwise, a variance from this mixing zone prohibition may be sought through the Clean Water Commission.

COMMENT #10-3: Clarify that mixing zone removal only applies to classified streams.
RESPONSE #10-3: The basis for a mixing zone is to allow for attenuation of the effluent that mitigates its effect on designated uses. Mixing zones are only allowed on classified waters, which have assigned designated uses. Unclassified streams normally have less flow than Class C streams, thus they don't likely provide any measurable attenuation, and consequently they do not qualify for a mixing zone allowance. Should a study be presented to show measurable attenuation within an unclassified stream, a variance from this mixing zone prohibition may be sought through the Clean Water Commission.

COMMENT #10-4: Consider alternatives to eliminating the mixing zones in low flow streams.
RESPONSE #10-4: Site-specific standards, use attainability analyses, and variances are some alternatives that already exist. The department will explore other ideas presented during future reviews for water quality standards revisions.

COMMENT #10-5: Clarify that mixing zones are allowed for bacteria.
RESPONSE #10-5: Like any other numerical criterion, bacteria limits are determined based on effluent and receiving water body characteristics, such as the potential for pollutant attenuation. Therefore, bacteria standards are eligible for a mixing zone allowance. The current wording of the rule does not expressly prohibit mixing for bacteria.

COMMENT #10-6: Instead of no mixing allowed on streams with less than 0.1 cubic feet per second, consider that 100% and instantaneous mixing occurs.
RESPONSE #10-6: The receiving stream 7Q10 flow (<0.1 cubic feet per second) is too small to have any significant mixing benefits, thus, the 100% and instantaneous

mixing does not provide any relief. Therefore, the proposed change has no effect on the water quality based effluent limits.

11-Biocriteria

COMMENT #11-1: The department should develop specific biocriteria for effluent dominated streams.
RESPONSE #11-1: Presently there is neither a special class nor unique water quality standards for streams where the physical, chemical, or biological properties are created or significantly influenced by effluent. The department may be exploring the need and options for developing specific criteria for those streams in future reviews of the water quality standards.

COMMENT #11-2: The department should develop an implementation procedure on biocriteria.
RESPONSE #11-2: Biological Criteria (or biocriteria) are narrative or numeric expressions that describe the reference biological integrity (structure and function) of aquatic communities inhabiting waters of a given designated aquatic life use. Biocriteria are based on the numbers and kinds of organisms present and are regulatory-based biological measurements. Additional information on biocriteria can be found at http://www.epa.gov/ost/biocriteria/basics/. Biocriteria are the best way to gauge the health level of the environment. The department currently uses biocriteria for water assessment and listing, and may explore the need to include a biocriteria implementation procedure into Missouri's water quality standards as part of future revisions to the standards.

12-Criteria for Drinking Water Supplies

COMMENT #12-1: The water quality standards and effluent regulations utilize the drinking water standards in certain sections as the default standard of choice. This is unreasonable and makes the presumption that water in a natural occurring watercourse or stream meets MCLs without any treatment. This is not factual, and specific standards should be developed to provide for water quality and an allowance for discharge. The proposed trihalomethane standards are such that treatment plants cannot discharge their drinking water that is in full compliance with Drinking Water Standards into Missouri's waters.
RESPONSE AND EXPLANATION OF CHANGE #12-1: Two criteria exist to protect waters designated as drinking water supplies: [1] Drinking Water Standards Maximum Contaminant Levels (MCLs) or [2] Section 304(a) criteria for human health for consumption of water plus organism. MCLs are the highest level of a contaminant that is allowed in drinking water based on the best available analytical and treatment technologies and taking cost into consideration (*2004 Edition of the Drinking Water Standards and Health Advisories*, p. iv, EPA 822-R-04-005). The majority of the time the Section 304(a) are more stringent due to the values being based solely on science and not on current technologies and cost. Where only the MCL or 304(a) criteria exist, but not both, the one that exists must be used. For

example for trihalomethanes, the MCL is 80 µg/L for the group of trihalomethanes (rather than specific types) while the 304(a) criteria apply only to specific types (e.g., bromoform). Future rulemakings could explore alternative standards if the science and adequate data were available to support the proposal. However, secondary drinking water regulations are non-enforceable federal guidelines regarding cosmetic effects (such as tooth or skin discoloration) or aesthetic effects (such as taste, odor, or color) of drinking water (*2004 Edition of the Drinking Water Standards and Health Advisories*, p. v, EPA 822-R-04-005). Therefore, the water quality standards for the protection of drinking water for iron and manganese, which are based on secondary drinking water regulations, are removed from Table A.

COMMENT #12-2: The standards as presented would not allow the discharge of drinking water to Missouri's streams which would meet the drinking water standards. Public drinking water under the new water quality standards may not be allowed to be discharged to a stream or lake as it is "too polluted" for the fish and biota, but not too polluted to drink.
RESPONSE #12-2: Criteria in Table A of the water quality standards are specific to each designated use. When more than one criterion is given for a certain pollutant (e.g., one for the protection of aquatic life and another for drinking water supplies) the most stringent criterion is applied to ensure that the most sensitive use in the water is protected. Drinking water criteria could be met (due to the criteria being based on MCLs, which take into account technology and costs) but be insufficient to protect aquatic life (due to the criteria being based on toxicology science). Future rulemakings could explore alternative standards if the science and adequate data were available to support the proposal.

COMMENT #12-3: One comment supported changing the analytical method for DWS metals from dissolved to total recoverable. Another noted that the department should make the effort now to develop adjusted metals criteria for drinking water supply that take into account the metals reductions that occur during drinking water treatment, and to provide scientifically defensible documentation to USEPA for the adjusted criteria.
RESPONSE #12-3: The science and data are not available at this time to support a proposed change to USEPA's guidance. The Department will consider changes in future standards revisions if the science and data are made available.

13-Bacteria Standards

COMMENT #13-1: *E. coli* standard of 126/100mL should be rounded to 130/100mL.
RESPONSE #13-1: An *E. coli* standard of 126/100mL is based on USEPA's 1986 bacteria criteria and their science and statistical analysis. Deviating from USEPA guidance, even slightly, requires justification beyond just desiring a simplification of the numbers.

COMMENT #13-2: Test methods for *E. coli* are significantly more complex and costly than fecal coliform. Additional trained laboratory technicians will be required as will new testing equipment.
RESPONSE #13-2: The test methods for *E. coli* can be more or less complex than the method for fecal coliform, depending on which method is chosen. Staff is aware that additional equipment and/or materials may need to be purchased to conduct the new tests. Up-front costs can be higher for *E. coli* than fecal coliform, but the long-term savings in labor can make up the cost for additional equipment. A transition period of three (3) years has been placed in the rule to enable laboratories and their staff to purchase the appropriate equipment and materials and to gain the necessary training.

COMMENT #13-3: Comments were divided on the need for a single sample maximum criterion for bacteria. Some comments support the criterion, others do not.
RESPONSE #13-3: According to USEPA Region 7, a single sample maximum is not required, but is recommended. The use of a single sample maximum is primarily for compliance with assessment of waters under section 305(b) of the Clean Water Act and to facilitate beach closure or risk notices. The department may explore this issue further during future discussions on this rule to determine the need for a single sample maximum.

COMMENT #13-4: Supports the proposed numeric criteria for whole body contact categories A and B. If category B criterion should be lowered, a footnote should be added to Table A explaining the illness rate of 1.4% was considered acceptable to the Clean Water Commission.
RESPONSE #13-4: The relationship between the numeric standard and an illness rate is clearly established in USEPA guidance. Should either of these factors change in the guidance published by USEPA, the department may reopen the rule to address any concerns such a change raises with the Commission.

COMMENT #13-5: Comments support the decision to protect recreational uses within unclassified waters with narrative or general criteria. These comments suggest that narrative criteria for protection of secondary contact recreation be applied rather than the proposed numeric criteria and further state that the numeric criteria proposed to protect secondary contact recreation have no meaningful scientific or risk basis. The comments also relay that USEPA has not developed any water quality criteria for secondary contact recreation, that Missouri's water quality standards already have a narrative criterion at 10 CSR 20-7.031(3)(E) that applies to all waters of the state and that "there shall be no significant human health hazard from incidental contact with the water." Additional comments were opposed to the higher bacteria levels for SCR than WBCR. A nine (9) fold increase is unacceptable, no matter how little the water bodies are used by the public for recreation.
RESPONSE #13-5: Secondary contact recreation is a designated use within the state. Designated uses should have criteria to protect those uses. While it is true that Missouri's narrative criteria do have protections for human health from

incidental contact with the water, a numeric criterion, where available and supported by science, is preferable as it provides a ready reference to measurable levels of pollutants from which to derive effluent limits or other discharge requirements. USEPA recommends a secondary contact recreation standard of 5 times the primary or whole body contact, but has also approved standards within other states at 9 times the whole body contact standard. It is true such a method is not based on a specific risk factor, therefore, the department may revisit this standard once more information becomes available on the risks from secondary contact with surface waters at various bacterial levels.

COMMENT #13-6: The fecal coliform and *E. coli* standards contained in 10 CSR 20-7.031(4)(C)1 and 2 [200/100mL for fecal coliform and 126/100mL for *E. coli*] should be used instead of other standards [548/100mL for *E. coli*] within this proposed rule. There is no scientific justification for higher levels that are protective of whole body contact recreation.
RESPONSE #13-6: USEPA guidance allows for subcategorizing of whole body contact for the purpose of meeting the goal of the federal Clean Water Act as long as the criteria associated with the subcategories are protective. The guidance states that for identified or popular beach areas a criterion based on risk levels of 8 or fewer illnesses per 1000 swimmers is protective [126/100mL for *E. coli*]. For other primary contact recreation waters a criterion based on a risk level not greater than 14 illnesses per 1000 swimmers is protective [548/100mL for *E. coli*]. The majority of Missouri's waters are not popular public beach areas, have a lower frequency of visitors, and present different risk levels. Therefore, most of Missouri's surface waters warrant different standards than those necessary for public beaches.

COMMENT #13-7: The secondary contact recreation standards in paragraph 10 CSR 20-7.031(4)(C)2 under the heading of *E. coli* bacteria is erroneously expressed as a fecal coliform count.
RESPONSE AND EXPLANATION OF CHANGE #13-7: The department corrected this error. The sentence now refers to *E. coli* and not fecal coliform.

COMMENT #13-8: May want to consider specifying that the bacteria criteria apply to anthropogenic sources of bacteria as in Kansas water quality standards. Defining the bacterial standard to apply to anthropogenic sources could be useful when bacterial source tracking studies identify migratory birds or other wildlife as a significant source.
RESPONSE #13-8: Bacteria levels, regardless of their source, must meet the applicable standard for the associated designated use. If non-anthropogenic sources are the cause of non-attainment of a use and those sources cannot be remedied, a use attainability analysis may be the appropriate method to address the situation, either by modifying the standard or removing the use designation.

COMMENT #13-9: An illness rate beyond the 1% risk level for whole body contact is not acceptable without extensive scientific justification such as an epidemiological study. The results of a recent external peer review of an USEPA reevaluation of the

1986 bacteria guidance shows that it is not scientifically defensible to extrapolate beyond a 1% risk level or 206/100 mL *E. coli*.
RESPONSE #13-9: Past USEPA guidance allowed for the use of a criterion at the 1.4% risk level. The state proposed the 1.4% risk level before knowledge of the recent external peer review. Discussions with stakeholders are needed due to the potential fiscal impact such a change in the standard could have statewide. The bacteria criterion for whole body contact recreation category B will remain as proposed until further discussions with stakeholders and USEPA.

COMMENT #13-10: A comment recommends that the bacteria geometric mean be established by sampling not less than four samples over a 30-day period.
RESPONSE #13-10: This issue needs to be discussed further to determine its appropriateness. Most water quality samples within the state are not taken weekly as would be suggested by the use of such a requirement.

COMMENT #13-10: The units for bacteria indicators should be "per 100 mLs" rather than CFU/100 mLs or colonies/100 mLs. This will allow for the analyst performing the tests to use either a membrane filter technique (CFU/100 mLs or colonies/100 mLs) or the most probable number technique (MPN/100 mLs). They are both comparable and acceptable methods, but it simplifies reporting if everything is reported the same, such as 126 per 100 mLs.
RESPONSE AND EXPLANATION OF CHANGE #13-10: The proposed language was not intended to exclude acceptable methods. Therefore "colonies" will be removed from the bacteria criteria resulting is a unit of "per 100 mL".

14-Metals Criteria

COMMENT #14-1: The calculation of metals limits based on cold water fisheries species statewide is more stringent than suggested or even requested by the USEPA. These rulemakings should focus on the issues identified by the USEPA. The extensive changes to the metals standards resulting from the water quality standards are dramatic, significant, and overly burdensome.
RESPONSE #14-1: The metals criteria for the protection of aquatic life were developed using USEPA toxicity study data and guidance. The four most sensitive genera were used to calculate each standard, which could be cold water genera or others depending on the parameter. All sensitive species or their surrogates need to be considered when a statewide standard is adopted. Future discussions with USEPA and stakeholders could result in more ecoregion specific standards if supported by local data.

COMMENT #14-2: Some comments stated the metals criteria are appropriate and should remain as proposed.
RESPONSE #14-2: Although several concerns have been expressed with the proposed criteria, the *Code of State Regulations* retains the criteria shown in the Proposed Rulemaking. As stated in earlier responses, the science and data are not available at this time to support a proposed change to USEPA's guidance. The

Department will consider changes in future standards revisions if the science and data are made available.

COMMENT #14-3: Requests that the proposed rule includes the needed flexibility to cost-effectively evaluate site-specific water quality criteria for heavy metals and cyanide. This should include alternative methods for developing water effect ratios, such as the use of a biotic ligand model and total-to-dissolved metals translators. The comment requests that adequate time be given to assess, plan, and implement the necessary improvements.
RESPONSE #14-3: Under subsection (4)(R) of the water quality standards, the procedure for site-specific criteria development for the protection of aquatic life is provided. Specifically paragraph 2 states that the department will provide guidance for establishing site-specific criteria using scientific procedures including, but not limited to, USEPA's Water Quality Standards Handbook. This allows the flexibility for many methods to be considered as long as all methods used are scientifically defensible. Section (10) allows the department to offer a schedule for a discharger to achieve compliance with water quality based limitations as well as the option to apply for a variance.

15-Criteria for Outstanding National Resource Waters

COMMENT #15-1: Discharges to losing streams connected to ONRWs should be prohibited. Discharges to groundwater should be avoided if possible.
RESPONSE #15-1: No new or expanded releases are allowed into the watershed of the Ozark National Scenic Riverways or any other ONRW. This prohibition eliminates the allowance for any degradation of groundwater from its current quality as a result of surface discharges.

COMMENT #15-2: Changes to the standards for ONRWs should not result in any lesser protection to these waters.
RESPONSE AND EXPLANATION OF CHANGE #15-2: The purpose of this rulemaking was to resolve any portion of the rule that may result in lesser protection to these waters as they might receive under the federal Clean Water Act. USEPA pointed out two portions of the rule that made special exceptions for discharges from Publicly Operated Treatment Works (POTWs) and mine dewatering. To ensure these discharges comply with the same requirements as all other discharges within the watersheds of ONRWs, the references to the exceptions were removed from the rule. Furthermore, to avoid any perception that the department intends to lessen any protection on these waters, the department is restoring all the existing language to Sections (7) and (8) of the rule with exception of the deletions described above. The department intends to review the existing language in Sections (7) and (8) during the development of an Antidegradation Implementation Procedure due to USEPA by April 30, 2007.

16-Criteria for Rare and Endangered Species

COMMENT #16-1: The presence of populations of federally threatened and endangered species dictates that water bodies have outstanding national ecological significance and should therefore receive special protection against any degradation in quality. Recommend that those stream segments identified with the upstream and downstream milepoints of known occurrences of federally threatened and endangered species be added to Table D and the definition of Outstanding National Resource Waters be amended to include these waters.
RESPONSE #16-1: Paragraph 10 CSR 20-7.031(1)(C)13. defines the designated use entitled "habitat for resident and migratory wildlife species" and provides for the protection of rare and endangered species. However, this use has neither been assigned to any water as of yet nor has any criteria been assigned to protect that use. These issues, among others to protect threatened and endangered species within the state of Missouri, are scheduled to be discussed during future rulemakings.

17-Losing Streams/Protection of Groundwater

COMMENT #17-1: All streams south of I-70 should be considered losing until a geologic study is completed
RESPONSE #17-1: Not all streams south of Interstate 70 were evaluated for potential groundwater connections, and it is likely that some of these streams are losing. Consequently, all streams are evaluated for potential groundwater connections as part of the permit application requirement. Therefore, designating all streams south of I-70 as losing stream would not necessarily add any protection to water quality but may pose unnecessarily stringent effluent limits where streams are found to not have a groundwater connection.

COMMENT #17-2: On comment suggested requiring disinfection of all wastewater discharging below (south) I-70. Another comment suggested that a study to determine losing status should be conducted on all water bodies being considered for recreational use removal.
RESPONSE #17-2: Disinfection is necessary only where needed to protect whole body contact recreation use and groundwater. The proposed rule will designate all classified streams for whole body contact recreation except where a UAA has demonstrated that the use is not existing and not attainable. Groundwater will be protected as explained in RESPONSE #17-1.

18-Table A - Numeric Water Quality Criteria

COMMENT #18-1: The current levels of dissolved oxygen (DO) do not allow aquatic life to thrive in an aquatic system. Recommend increasing the dissolved oxygen minimums during spawning periods and early life stages of aquatic life. The comment suggested alternative DO minimums.
RESPONSE #18-1: The current criterion for dissolved oxygen is based on USEPA guidance. The standards may accommodate specific criteria for different types of aquatic life uses. However, further discussion and research will be needed to develop the additional standards.

COMMENT #18-2: The department is proposing to adopt the same national water quality criteria for all aquatic life use subcategories (lakes, cold-water fisheries, cool water fisheries, general warm-water fisheries, and limited warm-water fisheries) without taking into consideration the differences in sensitivities of resident populations. The department should use EPA approved procedures for developing and implementing site-specific criteria to adopt water quality standards that are neither overprotective nor underprotective.
RESPONSE #18-2: Based on available science and resources at the time of the proposed rule, only a statewide standard was adopted. More specific criteria may be developed in the future for certain parameters within the different designated uses of aquatic life once more information is available.

COMMENT #18-3: The synergistic effects of combined pollutants are not considered in the proposed rules. Urge the Commission to study and consider how chemical actions combine to produce unforeseen effects.
RESPONSE #18-3: Currently, language at paragraph (4)(b)1. states that "More stringent criteria may be imposed if there is evidence of additive or synergistic effects." While this rule allows for the review of synergistic effects, this topic should be discussed in future rulemakings if more specific criteria are to be developed to address synergistic effects.

19-Ammonia Criteria and Early Life Stages

COMMENT #19-1: Three comments support the adoption of U.S. Environmental Protection Agency's 1999 Ammonia criteria.
RESPONSE #19-1: The portions of the proposed rule regarding total ammonia nitrogen are retained in the *Code of State Regulations* as proposed in the *Missouri Register*.

COMMENT #19-2: Several comments supported the protection of early life stages of aquatic life. Three comments recognize that USEPA is performing studies that may show the need for more stringent standards for ammonia in order to protect more sensitive species such as freshwater mussels and other filter feeders. Because the proposed criteria for ammonia reduces the stringency of ammonia standards under certain circumstances, the comments state that the proposed standards may not be protective of these more sensitive species. The comments request that the current ammonia standards be retained in order to protect the more sensitive species.
RESPONSE #19-2: The most recent ammonia criteria developed by USEPA are being proposed. The summary of the criteria states that some data for the fingernail clam indicate that the species would be affected at concentrations below the chronic criteria, while other data shows no effect. Since the criteria were approved by USEPA, new data has indicated additional sensitive species. However, new criteria has not been fully developed as of yet. Upon the development of new criteria, the department may later propose revisions to the standards to protect those species shown by future studies to be sensitive to any lesser ammonia levels. Until then, the

rules will reflect the latest guidance published by USEPA, which at this time are the 1999 ammonia criteria.

COMMENT #19-3: Consider defining a seasonal period during which early life stages of fish are present.
RESPONSE #19-3: Each water body has different assemblages of fish with differing sensitivities during their early life stages. To define a statewide seasonal period during which early life stages are present would create standards that are overly restrictive in most water bodies. The department may consider for the future adding information into the rule to better describe when early life stages of certain species are present. In the interim, the department may consult with aquatic life biologists and/or toxicologists as well as scientific materials to address any specific concerns regarding variations in the seasonal presence of early life stages.

COMMENT #19-4: There is a need to develop seasonal effluent limitations where they are appropriate, such as for ammonia, dissolved oxygen, and hardness dependent metals because of the dependency of these criteria on seasonal changes, such as temperature, pH, and hardness.
RESPONSE #19-4: Ammonia toxicity is highly dependent on water pH and temperature. The new rule proposes criteria for total ammonia nitrogen based on pH only (acute) or on pH and temperature of the receiving water (chronic). Currently, permitted facilities have winter and summer effluent limits for ammonia nitrogen. Having two seasons for ammonia nitrogen limits seems to be the optimum number. Hardness varies more with stream flow (rainfall) than with temperature, consequently, seasonality for hardness-dependent metal criteria is not practical. Dissolved oxygen saturation and content are temperature dependent in that they are inversely related to water temperature. Because DO is not a pollutant but a measure of the health of a water body and its criteria is a minimum, seasonal variation does not affect the criterion.

COMMENT #19-5: Paragraph 10 CSR 20-7.031(4)(B)7 should be reconsidered. Single (instantaneous) pH and temperature measurement may be appropriate for acute ammonia criterion. However, chronic ammonia criteria determination should be based on 30-day appropriate central tendencies of ambient pH and temperature data.
RESPONSE #19-5: Instantaneous pH and temperature data are needed for each sample to ensure compliance with the criteria. USEPA states that the calculation of an appropriate weighted average temperature or pH is complicated. USEPA also states that if samples obtained from a receiving water over a period of time during which pH and/or temperature is not constant, the pH, temperature, and the concentration of total ammonia in each sample should be determined. Then the concentration of the total ammonia nitrogen in the sample should be divided by the criterion to determine a quotient. The criterion is attained if the mean of the quotients is less than one over the duration of the averaging period.

COMMENT #19-6: The proposed rule would be improved by reflecting that the 1Q10 and 30Q10 flow values are used as design flows in determining zones of initial dilution and mixing zone allowances and as part of the wasteload allocation process. Also, specify the optional use of the 30Q5 design flow for calculating steady-state wasteload allocations.
RESPONSE #19-6: The proposed rule at section (4)(B)7.A. and B. states that the acute total ammonia nitrogen criteria shall be determined using the 1Q10 and the chronic criteria shall be determined using the 30Q10. These values are based on recommendation by USEPA in their total ammonia nitrogen guidance. The department believes this issue has been already addressed and proposes no changes to the rule language.

COMMENT #19-7: Clarify that references to early life stages apply to fish rather than any aquatic organism. The definition for early life stages is too focused on early life stages of fish, and does little to define the early life stages of other aquatic organisms. Freshwater mussels do not ordinarily "feed" (in the typical sense) during their larval (glochidial) stage. Fish are not the only aquatic organism with an early life stage that is affected by high levels of total ammonia nitrogen. Alternative language is needed in order for part (4)(B)7.C.(I) to include all aquatic organisms.
RESPONSE #19-7: The 1999 USEPA ammonia criteria are based on the toxicology of fish due to their known sensitivity to ammonia. Available toxicity data used by USEPA for invertebrates and other aquatic life showed either conflicting results or no toxic effect. However, recent research has indicated that other organisms, especially mussels, are sensitive to ammonia. Upon the development of new criteria, the department may later propose revisions to the standards to protect those species shown by future studies to be sensitive to any lesser ammonia levels. Until then, the rules will reflect the latest guidance published by USEPA, which at this time are the 1999 ammonia criteria.

COMMENT #19-8: There isn't a period of time when an early life stage of some type of aquatic organism would not be present in any aquatic system in Missouri when water is present. Alternative language is needed to show that early life stages of aquatic organisms are present at all times of the year.
RESPONSE #19-8: Subparagraph 10 CSR 20-7.031(4)(B)7.C. states, "without sufficient and reliable data, it is assumed that early life stages are present and must be protect at all times of the year." Data would need to be presented to prove when early life stages are absent. This comment has already been addressed by language in the rule.

COMMENT #19-9: It cannot be determined if or when chronic toxicity would not affect the long-term success of a population. This comment recommends deleting 10 CSR 20-7.031(4)(B)7.C.(II) from the proposed rule.
RESPONSE #19-9: USEPA conducted or gathered data on chronic toxicity for periods when early life stages are absent and developed criteria that would protect the long-term success of a population. Scientific toxicity tests are available to determine when specific early life stages are absent or at levels where toxicity is

unlikely to result in long-term effects on the population which should ensure the long-term success of a population. Should additional data be presented and new criteria developed that show the chronic criteria would affect the long-term success of a population, the department will revise the criteria. However, the department has not seen any evidence to support the removal of the chronic criteria for when early life stages are absent.

COMMENT #19-10: Professional fisheries biologists and other scientists should be consulted to determine the presence and duration of early life stages of aquatic organisms, especially organisms other than fish. This comment suggests alternative language for part 10 CSR 20-7.031(4)(B)7.C.(III).
RESPONSE #19-10: Part 10 CSR 20-7.031(4)(B)7.C.(I) states that "best professional judgement from fisheries biologists and other scientists will be considered as appropriate." Upon the development of new criteria to protect potential sensitive species other than fish, the department may later propose revisions to the language as suggested by the comment to protect those species. Until then, the rule language adequately allows for the requested consultation to take place.

20-Nutrient Criteria

COMMENT #20-1: The department needs to develop nutrient criteria. State should adopt USEPA guidance.
RESPONSE #20-1: The Department intends to develop nutrient criteria based on Missouri's unique characteristics. USEPA's guidance will be considered in the development of future water quality standards revisions on nutrient criteria.

21-Hancock Issue

COMMENT #21-1: This rulemaking violates the Hancock Amendment.
RESPONSE #21-1: This rulemaking does not violate the Hancock amendment, as it only serves to implement the requirements under federal law. The current rule designates all classified waters for whole body contact recreation, unless a Use Attainability Analysis (UAA) has demonstrated that such water cannot attain that use. This designation is required pursuant to the federal Clean Water Act (33 USC 1251). Article X, Section 21 of the Missouri Constitution establishes, "A new activity or service or an increase in the level of any activity or service beyond that required by existing law shall not be required by the general assembly or any state agency or counties or other political subdivisions, unless a state appropriation is made and disbursed to pay the county or other political subdivision for any increased costs." This amendment only prohibits the state from reducing its financed portion of any existing activity or service for which *state* law requires. The whole body contact recreation designation in this rule are not state requirements, but rather federal requirements.

The Supremacy Clause of the United States Constitution establishes that no state law, either statutory or constitutional, can prevent the full implementation of a federal law (U.S. Const. Art. 6)(*State of Missouri v. City of Glasgow*). The whole body contact designations and implementing requirements reflected in this rulemaking are mandated by federal law. Accordingly, the Hancock amendment, a state constitutional requirement, may not prevent the department from fully implementing requirements of federal law. Further, this the designations in this rule are no more stringent than those of federal law.

As a trustee of public funds, the department works hard to understand the fiscal impact of new environmental laws and to minimize expenses whenever possible. Therefore, the Department is working diligently to aid in the collection of data for the UAAs. Also, the program is structured to allow the maximum amount of flexibility in achieving compliance with these federal requirements.

22-Schedule of Compliance

COMMENT #22-1: Several comments addressed the proposed schedule of compliance at 10 CSR 20-7.015(9)(H):

- Implementation schedule should be extended to allow up to five years for compliance with the proposed rules.
- Permit holders who have applied for permit renewals but receive a permit after the effective date of the rule due to no fault of their own should get eight years to comply.
- Implementation schedule should be lengthened and should consider time necessary to conduct studies and to implement plans following the completion of studies.
- Compliance schedule should be expanded from 3 years to 5.
- Temporary waivers from the new rules should be granted for facilities that have submitted an application for a permit prior to the effective date of the rule.
- The rules should provide up to 5 years for compliance upon issuance of a permit.
- All facilities should not be granted more than 3 years from the effective date of the rule to comply with the bacteria standard.
- The implementation schedule should also consider the socio-economic impact to communities.
- More flexibility in schedule for complying with new bacteria standards (allow for 5 years)
- Rule should be amended to allow for a compliance schedule longer than 3 years, and suggests 5 years. Longer period is suggested for combined sewer overflow (CSO) communities.

RESPONSE AND EXPLANATION OF CHANGE #22-1: The revised language in section 10 refers to the Effluent Regulations at 10 CSR 20-7.015(9)(H) for a schedule to comply with new bacteria standards resulting from the new designation for whole body contact recreational use.

10 CSR 20-7.031 Water Quality Standards.

(1) Definitions.

(C) Beneficial *[water]* **or designated** uses. **Those uses specified in paragraphs 1.–15. of this subsection for each water body segment whether or not they are attained.** Beneficial **or designated** uses (1)(C)1.–11. of classified waters are identified in Tables G and H. Beneficial **or designated** uses (1)(C)12.–15. of classified waters must be determined on a site-by-site basis and are therefore not listed in Tables G and H.

1. Irrigation—Application of water to cropland or directly to plants that may be used for human or livestock consumption. Occasional supplemental irrigation, rather than continuous irrigation, is assumed.

2. Livestock and wildlife watering—Maintenance of conditions to support health in livestock and wildlife.

3. Cold-water fishery—Waters in which naturally occurring water quality and habitat conditions allow the maintenance of a naturally reproducing or stocked trout fishery and other naturally reproducing populations of recreationally important fish species.

4. Cool-water fishery—Waters in which naturally occurring water quality and habitat conditions allow the maintenance of a sensitive, high-quality sport fishery (including smallmouth bass and rock bass) and other naturally reproducing populations of recreationally important fish species.

5. Protection of aquatic life (General warm-water fishery)—Waters in which naturally occurring water quality and habitat conditions allow the maintenance of a wide variety of warm-water biota, including naturally reproducing populations of recreationally important fish species. This includes all Ozark Class C and P streams, all streams with seven (7)-day Q_{10} low flows of more than one-tenth cubic foot per second (0.1 cfs), all P1 streams and all classified lakes. However, individual Ozark Class C streams may be determined to be limited warm-water fisheries on the basis of limited habitat, losing-stream classification, land-use characteristics or faunal studies which demonstrate a lack of recreationally important fish species.

6. Protection of aquatic life (Limited warm-water fishery)—Waters in which natural water quality and/or habitat conditions prevent the maintenance of naturally reproducing populations of recreationally important fish species. This includes non-Ozark Class C streams and non-Ozark Class P streams with seven (7)-day Q_{10} low flows equal to or less than 0.1 cfs and Ozark Class C streams with the characteristics outlined in paragraph (1)(C)5.

7. Human health protection (Fish consumption)—Criteria to protect this use are based on the assumption of an average amount of fish consumed on a long-term basis. Protection of this use includes compliance with Food and Drug Administration (FDA) limits for fish tissue, maximum water concentrations corresponding to the 10^{-6} cancer risk level and other human health fish consumption criteria.

8. Whole body contact recreation—Activities in which there is direct human contact with the raw surface water to the point of complete body submergence. The raw water may be ingested accidentally and certain sensitive body organs, such as the eyes, ears and the nose, will be exposed to the water. Although the water may be ingested accidentally, it is not intended to be used as a potable supply unless acceptable treatment is applied. Water so designated is intended to be used for swimming, water skiing or skin diving. All waters in

Tables G and H of this rule are **presumed to support** *[designated for]* whole body contact recreation **unless a Use Attainability Analysis (UAA) has shown that the use is unattainable**. The use designation for whole body contact recreation may be removed or modified through a UAA **for only those waters where whole body contact is not an existing use**. Assignment of this use does not grant an individual the right to trespass when a land is not open to and accessible by the public through law or written permission of the landowner.

A. Category A—This category applies to those water segments that have been established by the property owner as public swimming areas allowing full and free access by the public for swimming purposes and waters with existing whole body contact recreational use(s). Examples of this category include, but are not limited to, public swimming beaches and property where whole body contact recreational activity is open to and accessible by the public through law or written permission of the landowner.

B. Category B—This category applies to waters designated for whole body contact recreation not contained within category A.

9. Secondary contact recreation—Uses include fishing, wading, commercial and recreational boating, any limited contact incidental to shoreline activities, and activities in which users do not swim or float in the water. These recreational activities may result in contact with the water that is either incidental or accidental and the probability of ingesting appreciable quantities of water is minimal. Assignment of this use does not grant an individual the right to trespass when a land is not open to and accessible by the public through law or written permission of the landowner.

10. Drinking water supply—Maintenance of a raw water supply which will yield potable water after treatment by public water treatment facilities.

11. Industrial process water and industrial cooling water—Water to support various industrial uses; since quality needs will vary by industry, no specific criteria are set in these standards.

12. Storm- and flood-water storage and attenuation—Waters which serve as overflow and storage areas during flood or storm events slowly release water to downstream areas, thus lowering flood peaks and associated damage to life and property.

13. Habitat for resident and migratory wildlife species, including rare and endangered species—Waters that provide essential breeding, nesting, feeding and predator escape habitats for wildlife including waterfowl, birds, mammals, fish, amphibians and reptiles.

14. Recreational, cultural, educational, scientific and natural aesthetic values and uses—Waters that serve as recreational sites for fishing, hunting and observing wildlife; waters of historic or archaeological significance; waters which provide great diversity for nature observation, educational opportunities and scientific study.

15. Hydrologic cycle maintenance—Waters hydrologically connected to rivers and streams serve to maintain flow conditions during periods of drought. Waters that are connected hydrologically to the groundwater system recharge groundwater supplies and assume an important local or regional role in maintaining groundwater levels.

(G) Early life stages **of fish**—The pre-hatch embryonic period, the post-hatch free embryo or yolk-sac fry, and the larval period during which the organism feeds. Juvenile fish, which are anatomically rather similar to adults, are not considered an early life stage.

(H) Existing uses—Those uses actually attained in the water body on or after November 28, 1975, whether or not they are identified in the water quality standards.

[(H)] **(I)** Ecoregion—A major region within the state which contains waters with similar geological, hydrological, chemical and biological characteristics.

[(I)] **(J)** Epilimnion—Zone of atmospheric mixing in a thermostratified lake.

[(J)] **(K)** Fecal coliform bacteria—A group of bacteria originating in intestines of warm-blooded animals which indicates the possible presence of pathogenic organisms in water.

[(K)] **(L)** Hypolimnion—Zone beneath the zone of atmospheric mixing in a thermostratified lake.

[(L)] **(M)** Lethal concentration$_{50}$ (LC_{50})—Concentration of a toxicant which would be expected to kill fifty percent (50%) of the individuals of the test species organisms in a test of specified length of time.

[(M)] **(N)** Losing stream—A stream which distributes thirty percent (30%) or more of its flow during low flow conditions through natural processes, such as through permeable geologic materials into a bedrock aquifer within two (2) miles' flow distance downstream of an existing or proposed discharge. Flow measurements to determine percentage of water loss must be corrected to approximate the seven (7)-day Q_{10} stream flow. If a stream bed or drainage way has an intermittent flow or a flow insufficient to measure in accordance with this rule, it may be determined to be a losing stream on the basis of channel development, valley configuration, vegetation development, dye tracing studies, bedrock characteristics, geographical data and other geological factors. Losing streams are listed in Table J; additional streams may be determined to be losing by *[Geological Survey and Resource Assessment Division]* **the Missouri Department of Natural Resources**.

[(N)] **(O)** Low-flow conditions—Where used in this regulation in the context of mixing zones, the low-flow conditions shall refer to the minimum amount of stream flow occurring immediately upstream of a wastewater discharge and available, in whole or in part, for *[dilution or assimilation]* **attenuation** of wastewater *[discharges]* **pollutants**.

1. Seven (7)-day**,** one (1)-in-ten (10)-year low flow (7-day Q_{10})—The lowest average flow for seven (7) consecutive days that has a probable recurrence interval of once-in-ten (10) years**.**

2. Sixty (60)-day, one (1)-in-two (2)-year low flow (60-day Q_2)—The lowest average flow for sixty (60) consecutive days that has a probable recurrence interval of once-in-two (2) years.

3. Thirty (30)-day, one (1)-in-ten (10)-year low flow (30-day Q_{10})—The lowest average flow for thirty (30) consecutive days that has a probable recurrence interval of once-in-ten (10) years.

4. One (1)-day, one (1)-in-ten (10)-year low flow (1-day Q_{10})—The lowest average flow for one (1) day that has a probable recurrence interval of once-in-ten (10) years.

[(O)] **(P)** Mixing zone—An area of dilution of effluent in the receiving water beyond which chronic toxicity criteria must be met.

[(P)] **(Q)** Outstanding national resource waters—Waters which have outstanding national recreational and ecological significance. These waters shall receive special protection against any degradation in quality. Congressionally designated rivers, including those in the Ozark national scenic riverways and the wild and scenic rivers system, are so designated (see Table D).

[(Q)] **(R)** Outstanding state resource waters—High quality waters with a significant aesthetic, recreational or scientific value which are specifically designated as such by the Clean Water Commission (see Table E).

[(R)] **(S)** Ozark streams—Streams lying within the Ozark faunal region as described in the *Aquatic Community Classification System for Missouri*, Missouri Department of Conservation, 1989.

[(S)] **(T)** Reference lakes or reservoirs—Lakes or reservoirs determined by Missouri Department of Natural Resources to be the best available representatives of ecoregion waters in a natural condition with respect to habitat, water quality, biological integrity and diversity, watershed land use, and riparian conditions.

[(T)] **(U)** Reference stream reaches—Stream reaches determined by the department to be the best available representatives of ecoregion waters in a natural condition, with respect to habitat, water quality, biological integrity and diversity, watershed land use and riparian conditions.

[(U)] **(V)** Regulated-flow streams—A stream that derives a majority of its flow from an impounded area with a flow-regulating device.

(W) Use Attainability Analysis—A structured scientific assessment of the factors affecting the attainment of the use which may include physical, chemical, biological, and economic factors as described in 40 CFR 131.10(g).

[(V)] **(X)** Water effect ratio—Appropriate measure of the toxicity of a material obtained in a site water divided by the same measure of the toxicity of the same material obtained simultaneously in a laboratory dilution water.

[(W)] **(Y)** Water hardness—The total concentration of calcium and magnesium ions expressed as calcium carbonate. For purposes of this rule, hardness will be determined by the lower twenty-fifth percentile value of a representative number of samples from the water body in question or from a similar water body at the appropriate stream flow conditions.

[(X)] **(Z)** Water quality criteria—Chemical, physical and biological properties of water that are necessary to protect beneficial water uses.

[(Y)] **(AA)** Waters of the state—All rivers, streams, lakes, and other bodies of surface and subsurface water lying within or forming a part of the boundaries of the state which are not entirely confined and located completely upon lands owned, leased, or otherwise controlled by a single person or by two (2) or more persons jointly or as tenants in common and includes waters of the United States lying within the state.

[(Z)] **(BB)** Wetlands—Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. This definition is consistent with both the United States Army Corps of Engineers 33 CFR 328.3(b) and the United States Environmental Protection Agency 40 CFR 232.2(r).

[(AA)] **(CC)** Whole effluent toxicity tests—A toxicity test conducted under specified laboratory conditions on specific indicator organisms. To estimate chronic and acute toxicity of the effluent in its receiving stream, the effluent may be diluted to simulate the computed percent effluent at the edge of the mixing zone or zone of initial dilution.

[(BB)] **(DD)** Zone of initial dilution—A small area of initial mixing below an effluent outfall beyond which acute toxicity criteria must be met.

[(CC)] **(EE)** Zone of passage—A continuous water route necessary to allow passage of organisms with no acutely toxic effects produced on their populations.

*[(DD)]***(FF)** Other definitions as set forth in the Missouri Clean Water Law and 10 CSR 20-2.010 shall apply to terms used in this rule.

(4) Specific Criteria. The specific criteria shall apply to classified waters. Protection of drinking water supply is limited to surface waters designated for raw drinking water supply and aquifers. Protection of whole body contact recreation is limited to classified waters designated for that use. *[Only waters designated for livestock and wildlife watering are considered to be long-term supplies and are subject to the chronic toxicity requirements of the specific criteria.]*

(C) Bacteria. Protection of whole body contact recreation is limited to classified waters designated for that use. Either of the following bacteria criterion shall apply until *[a date three (3) years from the effective date of this rule]* **December 31, 2008**; at which time, only *E. coli* criterion shall apply. The recreational season is from April 1 to October 31.

1. Fecal coliform bacteria—the fecal coliform count shall not exceed the criterion listed in Table A as a geometric mean during the recreational season in waters designated for whole body contact recreation. The fecal coliform count shall not exceed two hundred (200) *[colonies]* per one hundred milliliters (100 mL) at any time in losing streams. For waters designated for secondary contact recreation, the fecal coliform count shall not exceed one thousand eight hundred (1,800) *[colonies]* per one hundred milliliters (100 mL) as a geometric mean during the recreational season; or

2. *E. Coli* bacteria—the *E. coli* count shall not exceed the criterion listed in Table A as a geometric mean during the recreational season in waters designated for whole body contact recreation. The *E. coli* count shall not exceed one hundred twenty-six (126) *[colonies]* per one hundred milliliters (100 mL) at any time in losing streams. For waters designated for secondary contact recreation, the *[fecal coliform]* ***E. coli*** count shall not exceed one thousand one hundred thirty-four (1,134) *[colonies]* per one hundred milliliters (100 mL) as a geometric mean during the recreational season.

(R) Site-specific Criteria Development for the Protection of Aquatic Life. When water quality criteria in this regulation are either underprotective or overprotective of water quality due to natural, non-anthropogenic conditions for a given water body segment, a petitioner may request site-specific criteria. The petitioner must provide the department with sufficient documentation to show that the current criteria are not adequate and that the proposed site-specific criteria will protect all existing and/or potential uses of the water body.

1. Site-specific criteria may be appropriate where, but is not limited to **the examples given in subparagraphs A. or B. of this paragraph**:

A. The resident aquatic species of the selected water body have a different degree of sensitivity to a specific pollutant as compared to those species in the data set used to calculate the national or state criteria*[.]* **as described in either of the following parts:**

(I) Natural adaptive processes have enabled a viable, balanced aquatic community to exist in waters where natural (non-anthropogenic) background conditions exceed the criterion (e.g., resident species have evolved a genetically based greater tolerance to high concentrations of a chemical)*[.]***; or**

(II) The composition of aquatic species in a water body is different from those used in deriving a criterion (e.g., most of the species considered among the most sensitive, such

as salmonids or the cladoceran, *Ceriodaphinia dubia*, which were used in developing a criterion, are absent from a water body).

B. The physical and/or chemical characteristics of the water body alter the biological availability and/or toxicity of the pollutant (e.g., pH, alkalinity, salinity, water temperature, hardness).

2. All petitioners seeking to develop site-specific criteria shall coordinate with the department early in the process. This coordination will insure the use of adequate, relevant, and quality data; proper analysis and testing; and defendable procedures. The department will provide guidance for establishing site-specific water quality criteria using scientific procedures including, but not limited to, those procedures described in the U. S. Environmental Protection Agency's "Water Quality Standards Handbook," Second Edition, August 1994.

3. Site-specific criteria shall protect all life stages of resident species and prevent acute and chronic toxicity in all parts of a water body.

4. Site-specific criteria shall include both chronic and acute concentrations to better reflect the different tolerances of resident species to the inherent variability between concentrations and toxicological characteristics of a chemical.

5. Site-specific criteria shall be clearly identified as maximum "not to be exceeded" or average values, and if an average, the averaging period and the minimum number of samples. The conditions, if any, when the criteria apply shall be clearly stated (e.g., specific levels of hardness, pH, or water temperature). Specific sampling requirements (e.g., location, frequency), if any, shall also be identified.

6. The data, testing procedures, and application (safety) factors used to develop site-specific criteria shall reflect the nature of the chemical (e.g., persistency, bioaccumulation potential, and avoidance or attraction responses in fish) and the most sensitive resident species of a water body.

7. The size of a site may be limited to a single *[stream]* **water** segment, **single water subsegment**, or may cover a whole watershed depending on the particular situation for which the specific criterion is developed. A group of water bodies may be considered one site if their respective aquatic communities are similar in composition and have comparable water quality.

8. The department shall determine if a site-specific criterion is adequate and justifiable. Each site-specific criterion shall be promulgated into rule 10 CSR 20-7.031. The public notice shall include a description of the affected water body or water body segment and the reasons for applying the proposed criterion. If the department determines that there is significant public interest, a public hearing may be held in the geographical vicinity of the affected water body or water body segment. Any site-specific criterion promulgated under these provisions is subject to U.S. EPA approval prior to becoming effective.

(7) Outstanding National Resource Waters. **Under section (2), antidegradation section of this rule, new releases to outstanding national resource waters from any source are prohibited and releases from allowed facilities***[. All discharges into these waters or into the watershed of these waters]* are subject to special effluent limitations as required in 10 CSR 20-7.015(6). Table D contains a list of the outstanding national resource waters in Missouri.

(8) Outstanding State Resources Waters.

The commission wishes to recognize certain high-quality waters that may require exceptionally stringent water-quality management requirements to assure conformance with the antidegradation policy. **The degree of management requirements will be decided on an individual basis. To qualify for inclusion, all of the following criteria must be met.** *[All discharges into these waters or into the watershed of these waters are subject to special effluent limitations as required in 10 CSR 20-7.015(6). Table E contains a list of the outstanding state resource waters in Missouri.]* The waters listed in Table E must—

(A) Have a high level of aesthetic or scientific value;

(B) Have an undeveloped watershed; and

(C) Be located on or pass through lands which are state or federally owned, or which are leased or held in perpetual easement for conservation purposes by a state, federal, or private conservation agency or organization.

(10) Compliance with Water Quality Based Limitations. Compliance with new or revised National Pollutant Discharge Elimination System (NPDES) or Missouri operating permit limitations based on criteria in this rule shall be achieved with all deliberate speed and no later than three (3) years from the date of issuance of the permit **except where provided for otherwise in 10 CSR 20-7.015(9)(H)**.

Table A—Criteria for Designated Uses

WBC = Whole Body Contact Recreation
SCR = Secondary Contract Recreation
AQL = Protection of Aquatic Life
HHF = Human Health Protection—Fish Consumption
DWS = Drinking Water Supply
LWW = Livestock, Wildlife Watering
GRW = Groundwater

Pollutant (*[colonies]*/100 mL)	WBC-A	WBC-B	SCR
Fecal Coliform Bacteria*****	200		1800
E.coli Bacteria*	126	548	1134

*Geometric mean during the recreational season in waters designated for recreation or at any time in losing streams. The recreational season is from April 1 to October 31.

Pollutant (µg/L)	AQL	HHF	DWS	IRR	LWW	GRW
Metals						
Aluminum (acute)	750					
Antimony		4300	6			6
Arsenic	20		50	100		50
Barium			2000			2000
Beryllium	5		4	100		4
Boron			2000			2000
Cadmium	*		5			5
Chromium III	*		100	100		100
Chromium VI						
chronic	10					
acute	15					
Cobalt					1000	1000
Copper	*		1300		500	1300
Iron	1000		*[300]*			300
Lead	*		15			15
Manganese			*[50]*			50
Mercury			2			2
chronic:	0.5					
acute:	2.4					
Nickel	*		100			100
Selenium	5		50			50
Silver	*		50			50
Thallium		6.3	2			2
Zinc	*****		5000			5000

*See Metals (Hardness Dependent)

TABLE H-STREAM CLASSIFICATIONS AND USE DESIGNATIONS

WATER BODY	CLASS	MILES	FROM	TO	COUNTY	COUNTY 2	IRR	LWW	AQL	CLF	CDF	WBC	SCR	DWS	IND
Bachelor Cr.	C	1.0	Mouth	**0**8,42N,**0**1W	Franklin			x	x			*[B]*			
Barber Cr.	C	7.5	Mouth	Hwy. 136	Sullivan	Putnam		x	x			*[B]*			
Basin Fk.	C	12.7	Mouth	17,44N,23W	Pettis			x	x			*[B]*			
Bell Cr.	C	6.0	Mouth	**0**9,37N,12W	Pulaski			x	x			*[B]*			
Big Bottom Cr.	C	*[5.0]* **1.9**	Mouth	*[13,37N,7E]* **Lake Ann**	Ste. Genevieve			x	x			*[B]*			
Big Bottom Cr.	C	*[5.0]* **2.1**	*[Mouth]* **Lake Ann**	13,37N,**0**7E	Ste. Genevieve			x	x			B			
Big Deer Cr.	C	4.0	Mouth	27,42N,31W	Bates			x	x			*[B]*			
Big Muddy Cr.	C	11.0	33,60N,27W	**0**9,61N,27W	Daviess			x	x			*[B]*			
Bigelow's Cr.	C	5.0	Mouth	15,44N,**0**1E	St. Charles			x	x			*[B]*			
Trib. to Bird Br.	C	0.6	Mouth	14,41N,22W	Benton			x	x			*[B]*			
Birkhead Br.	C	2.0	Mouth	16,49N,**0**2E	Lincoln			x	x			*[B]*			
Blue Ditch	C	5.0	14,27N,14E	29,28N,14E	Scott		x	x	x			*[B]*	x		
Blythes Cr.	P	6.5	Mouth	Bus. Hwy. 54	Moniteau	Miller		x	x			*[B]*			
Bones Br.	C	5.5	Mouth	29,41N,31W	Bates			x	x			*[B]*			
Trib. to Browns Br.	C	3.0	Mouth	13,43N,**0**1W	Franklin			x	x			*[B]*			
Brushy Cr.	P	3.0	Mouth	SW32,46N,21W	Pettis			x	x			*[B]*			
Burgher Br.	C	2.0	Mouth	**0**7,37N,**0**7W	Phelps			x	x			*[B]*			
Burkhart Br.	C	3.5	Mouth	12,31N,12W	Texas			x	x			*[B]*			
Burton Br.	C	2.0	Mouth	13,31N,10W	Texas			x	x			*[B]*			
Trib. to Busch Cr.	C	1.5	Mouth	35,44N,1W	Franklin			x	x			*[B]*			
Trib. to Busch Cr.	C	2.0	Mouth	34,44N,1W	Franklin			x	x			*[B]*			
Callahan Cr.	C	11.5	Mouth	23,50N,14W	Boone			x	x			*[B]*			
Camp Br.	C	3.5	Mouth	35,29N,10W	Texas			x	x			*[B]*			
Carney Cr.	C	4.0	Mouth	3,24N,25W	Barry			x	x			*[B]*			
Cason Br.	C	2.5	Mouth	21,45N,10W	Callaway			x	x			*[B]*			
Clark Fk.	C	6.0	15,43N,13W	34,43N,13W	Cole			x	x			*[B]*			
Clear Cr.	C	12.0	Mouth	State Line	Nodaway			x	x			*[B]*			
Clear Cr.	C	2.5	Mouth	36,49N,6W	Montgomery			x	x			*[B]*			
Cole Camp Cr.	C	4.3	07,42N,21W	27,43N,21W	Benton			x	x			*[B]*			
Collier Cr.	C	2.5	Mouth	18,45N,8W	Callaway			x	x			*[B]*			
Coon Cr.	C	9.0	Mouth	**0**8,53N,13W	Monroe	Randolph		x	x			*[B]*			
Trib. to Coon Cr.	C	1.0	Mouth	32,54N,13W	Randolph			x	x			*[B]*			
Coon Cr.	C	13.0	Mouth	10,50N,6W	Montgomery			x	x			*[B]*			
Trib to Coon Cr.	C	0.5	Mouth	11,45N,22W	Pettis			x	x			*[B]*			
Cow Cr.	C	2.5	Mouth	26,47N,8W	Callaway			x	x			*[B]*			
Cox Br.	C	2.2	Mouth	Hwy.V	Phelps			x	x			*[B]*			
Craven Ditch	C	11.0	Mouth	16,24N,6E	Butler		x	x	x			*[B]*			
Trib. to Davis Cr.	C	3.0	Mouth	3,61N,38W	Holt			x	x			*[B]*			
Davis Cr. Ditch	C	6.5	Mouth	6,61N,38W	Holt			x	x			*[B]*			
Dicks Cr.	C	7.0	Mouth	33,54N,33W	Platte			x	x			*[B]*			
Ditch #8	C	20.5	12,21N,11E	1,24N,11E	New Madrid	Stoddard		x	x			*[B]*			
Dog Cr.	C	7.0	12,40N,14W	5,39N,14W	Miller			x	x			*[B]*			
Double Br.	C	6.0	Mouth	19,39N,30W	Bates			x	x			*[B]*			
Dry Hollow	C	0.5	15,28N,28W	22,28N,28W	Lawrence			x	x			*[B]*			
Dry Valley Br.	C	2.0	26,27N,29W	25,27N,29W	Newton	Lawrence		x	x			*[B]*			
Dubois Cr.	C	4.0	Hwy. 100	Hwy. 47	Franklin			x	x			*[B]*			
E. Brush Cr.	C	8.0	Mouth	16,45N,15W	Moniteau			x	x			*[B]*			
E. Fk. Honey Cr.	C	8.0	29,63N,23W	3,64N,23W	Grundy	Mercer		x	x			*[B]*			
E. Fk. Locust Cr.	P	*[16.0]* **3.6**	*[Mouth]* **23,62N,20W**	Hwy. 6	Sullivan			x	x			*[B]*			
E. Fk. Locust Cr.	P	*[16.0]* **13.0**	Mouth	*[Hwy. 6]* **23,62N,20W**	Sullivan			x	x			B			
E. Fk. Roubidoux Cr.	C	4.5	4,31N,11W	24,31N,11W	Texas			x	x			*[B]*			
E. Yellow Cr.	P	32.0	20,56N,19W	7,60N,18W	Chariton	Linn		x	x			*[B]*	x		
Elkhorn Cr.	C	8.0	Mouth	13,63N,37W	Nodaway			x	x			*[B]*			
Emery Hollow	C	3.9	Mouth	28,31N,10W	Texas			x	x			*[B]*			
Factory Cr.	C	4.0	2,46N,14W	32,47N,14W	Moniteau			x	x			*[B]*			
Fenton Cr.	C	0.6	Mouth	Hwy. V	Franklin			x	x			*[B]*			
Trib. to Flat Cr.	C	2.3	Mouth	15,45N,20W	Pettis			x	x			*[B]*			
Flinger Br.	C	1.7	Mouth	17,28N,08W	Texas			x	x			*[B]*			
Fountain Farm Br.	C	1.8	Mouth	32,38N,03E	Washington			x	x			*[B]*			

Gabriel Cr.	C	*[13.0]*	**11.1**	*[7,44N,18W]* **24,44N,19W**	**0**3,42N,19W	Morgan			x	x	*[B]*				
Gabriel Cr.	C	*[13.0]*	**1.9**	**0**7,44N,18W	*[3,42N,19W]* **24,44N,19W**	Morgan			x	x	B				
Gillum Cr.	C	2.5		Mouth	23,39N,33W	Bates			x	x	*[B]*				
Grantham Cr.	C	2.0		Mouth	2,64N,33W	Gentry			x	x	*[B]*				
Haldiman Br.	C	3.0		Mouth	10,46N,14W	Moniteau			x	x	*[B]*				
Hickory Cr.	C	7.0		Mouth	9,60N,25W	Grundy			x	x	*[B]*				
Hocum Hollow	C	0.5		Mouth	Sur 1856,40N,6E	Jefferson			x	x	*[B]*				
Hominy Cr.	C	1.0		Mouth	Hwy 63	Boone			x	x	*[B]*				
Honey Cr.	C	4.0		Mouth	29,43N,12W	Cole			x	x	*[B]*				
Horseshoe Cr.	C	5.8		Mouth	10,48N,29W	Jackson	Lafayette		x	x	*[B]*				
Huldy Hollow	C	2.0		Mouth	28,31N,07W	Texas			x	x	*[B]*				
Indian Cr.	C	3.0		30,30N,9W	27,30N,9W	Texas			x	x	*[B]*				
Johnson Br.	C	1.0		Mouth	29,30N,9W	Texas			x	x	*[B]*				
Kelley Br.	C	5.0		Mouth	15,50N,12W	Boone			x	x	*[B]*				
Ketchum Hollow	C	1.5		Mouth	24,22N,27W	Barry			x	x	*[B]*				
Knob Cr.	C	6.5		Mouth	8,41N,32W	Bates			x	x	*[B]*				
Koen Cr.	C	1.0		Mouth	5,36N,5E	St. Francois			x	x	*[B]*				
Trib. to L. Beaver Cr.	C	2.0		Mouth	16,37N,8W	Phelps			x	x	*[B]*				
L. Cedar Cr.	C	*[6.0]*	**2.0**	[Mouth] **17,48N,11W**	**0**5,48N,11W	Boone			x	x	*[B]*				
L. Cedar Cr.	C	[6.0]	**4.0**	Mouth	*[5,48N,11W]* **17,48N,11W**	Boone			x	x	B				
L. Deer Cr.	C	3.0		Mouth	31,42N,30W	Bates			x	x	*[B]*				
L. Dry Fk.	C	4.5		8,37N,7W	5,36N,7W	Phelps			x	x	*[B]*				
L. Shaver Cr.	C	4.9		Mouth	04,45N,20W	Pettis			x	x	*[B]*				
L. Third Fk. Platte R.	C	20.0		Mouth	27,60N,32W	DeKalb			x	x	*[B]*				
Trib. to Labadie Cr.	P	2.0		Mouth	6,43N,2E	Franklin			x	x	*[B]*				
Lateral Ditch #2	C	3.0		Mouth	9,22N,10E	Dunklin			x	x	*[B]*				
Lick Cr. Ditch	C	16.0		33,25N,9E	15,26N,10E	Stoddard			x	x	*[B]*				
Long Br.	C	13.0		Mouth	11,59N,20W	Linn			x	x	*[B]*			x	
Main Ditch #8	C	12.0		3,19N,12E	18,20N,14E	Pemiscot			x	x	*[B]*				
Maline Creek	C	1.0		Mouth	Bellefontaine Rd.	St. Louis City	St. Louis		x	x	*[B]*				
Mayhen Br.	C	1.3		Mouth	18,28N,08W	Texas			x	x	*[B]*				
Trib. to Mill Cr.	C	0.5		Mouth	19,37N,3E	Washington			x	x	*[B]*				
Mineral Spring Hollow	C	0.8		Mouth	30,31N,09W	Texas			x	x	*[B]*				
Mississippi R.	P	*[200.5]* **5.0**		*[Ohio R.]* **Dam #27.**	Missouri R.	*[Mississippi]* **St. Louis City**	St. Charles	x	x	x	B	x	x	x	
Mississippi R.	P	*[200.5]* **195.5**		Ohio R.	*[Missouri R.]* **Dam #27**	Mississippi	*[St. Charles]* **St. Louis City**	x	x	x	*[B]*	x	x	x	
Mooney Br.	C	2.0		Mouth	3,33N,10W	Texas			x	x	*[B]*				
Trib. to Moreau R.	C	0.5		Mouth	**0**6,43N,12W	Cole			x	x	*[B]*				
Muddy Cr.	P	36.5		Mouth	22,66N,23W	Grundy	Mercer		x	x	*[B]*				
Muddy Cr.	C	*[10.0]*	**5.5**	*[Mouth]* **31,58N,20W**	**0**5,58N,20W	Linn			x	x	*[B]*				
Muddy Cr.	C	*[10.0]*	**4.5**	Mouth	*[5,58N,20W]* **31,58N,20W**	Linn			x	x	B				
Muddy Cr.	C	9.0		Mouth	22,52N,21W	Saline			x	x	*[B]*				
Muddy Fk.	C	8.0		Mouth	35,54N,31W	Clay			x	x	*[B]*				
N. Fk. M Fabius R.	C	*[16.0]*	**16.2**	*[22,64N,12W]* **36,65N,13W**	21,66N,14W	Scotland	Schuyler		x	x	*[B]*				
N. Fk. M Fabius R.	C	*[16.0]*	**9.2**	22,64N,12W	*[21,66N,14W]* **36,65N,13W**	Scotland	Schuyler		x	x	B				
N. Fk. Grindstone Cr.	C	1.5		20,48N,12W	16,48N,12W	Boone			x	x	*[B]*				
Natural Bridge Holl.	C	2.0		Mouth	17,22N,26W	Barry			x	x	*[B]*				
North R.	C	*[16.0]*	**12.2**	*[Hwy. 15]* **28,60N,11W**	Hwy. 151	Shelby	Knox		x	x	*[B]*				
North R.	C	*[16.0]*	**5.0**	Hwy. 15	*[Hwy. 151]* **28,60N,11W**	Shelby	Knox		x	x	B				
Owl Cr.	C	4.6		Mouth	24,54N,35W	Platte			x	x	*[B]*				
Panther Cr.	C	3.5		Mouth	28,57N,26W	Caldwell			x	x	*[B]*				
Panther Cr.	C	11.0		Mouth	14,39N,29W	Bates			x	x	*[B]*				
Paris Br.	C	3.0		Mouth	31,50N,1W	Lincoln			x	x	*[B]*				
Pike Slough	C	5.0		Mouth	28,24N,6E	Butler			x	x	*[B]*				
Pleasant Valley Cr.	C	1.0		14,39N,5W	24,39N,5W	Crawford			x	x	*[B]*				
Quick Cr.	C	4.5		28,46N,5W	25,46N,6W	Montgomery			x	x	*[B]*				

Raccoon Cr.	C	4.0	Mouth	5,61N,25W	Grundy		x	x	*[B]*
Rattlesnake Cr.	C	3.0	Mouth	3,56N,25W	Livingston		x	x	*[B]*
Trib. to Red Oak Cr.	C	1.5	35,42N,05W	27,42N,05W	Gasconade		x	x	*[B]*
Richland Cr.	C	4.0	Mouth	29,48N,9W	Callaway		x	x	*[B]*
Rising Cr.	P	1.0	Mouth	M.P.R.R. tracks	Cole		x	x	*[B]*
Rising Cr.	C	4.0	M.P.R.R tracks	36,44N,11W	Cole		x	x	*[B]*
River des Peres	P	1.5	Mouth	Gravois Cr.	St. Louis City		x	x	*[B]*
River des Peres	C	1.0	Gravois Cr.	Morgan Ford Road	St. Louis City		x	x	*[B]*
Rock Br.	C	1.6	Mouth	10,32N,10W	Texas		x	x	*[B]*
Trib. to Rockhouse Cr.	C	2.5	Mouth	34,23N,26W	Barry		x	x	*[B]*
Rubeneau Br.	C	2.0	Mouth	Sur 2115,37N,3E	Washington		x	x	*[B]*
Trib. to S. Moreau Cr.	C	1.5	Mouth	29,42N,15W	Miller		x	x	*[B]*
Sand Hollow	C	0.3	Mouth	24,31N,10W	Texas		x	x	*[B]*
Sanford Cr.	C	1.0	Mouth	4,43N,10W	Cole		x	x	*[B]*
Sewer Br.	C	1.0	Mouth	16,46N,21W	Pettis		x	x	*[B]*
Trib. to Shibboleth Cr.	C	1.0	Mouth	15,38N,3E	Washington		x	x	*[B]*
Slabtown Br.	C	3.3	Mouth	23,33N,10W	Texas		x	x	*[B]*
Slaughter Br.	C	3.0	Mouth	4,43N,2W	Franklin		x	x	*[B]*
Soap Cr.	C	4.1	19,42N,04W	11,42N,05W	Gasconade		x	x	*[B]*
Spencer Cr.	C	1.5	Mouth	Sur 735,47N,4E	St. Charles		x	x	*[B]*
Spring Br.	P	*[10.0]* **7.4**	*[Mouth]* **02,34N,06W**	Hwy. 32	Dent		x	x	*[B]*
Spring Br.	P	*[10.0]* **4.8**	Mouth	*[Hwy. 32]* **02,34N,06W**	Dent		x	x	B
Stream Mill Hollow	C	2.0	27,32N,10W	28,32N,10W	Texas		x	x	*[B]*
Sugar Br.	P	2.0	Mouth	12,48N,14W	Boone		x	x	*[B]*
Sugar Br.	C	2.0	12,48N,14W	I-70	Boone		x	x	*[B]*
Sugar Camp Hollow	C	2.5	Mouth	17,23N,26W	Barry		x	x	*[B]*
Third Fk. Platte R.	C	*[31.5]* **25.0**	*[Mouth]* **08,57N,33W**	25,61N,33W	Buchanan	Gentry	x	x	*[B]*
Third Fk. Platte R.	C	*[31.5]* **7.5**	Mouth	*[25,61N,33W]* **08,57N,33W**	Buchanan	Gentry	x	x	B
Three Hill Cr.	C	4.0	Mouth	7,37N,4E	St. Francois		x	x	*[B]*
Todd Cr.	C	9.5	Mouth	15,52N,34W	Platte		x	x	*[B]*
Turkey Cr.	C	2.5	Mouth	34,27N,8E	Stoddard		x	x	*[B]*
W. Fk. Honey Cr.	C	12.5	29,63N,23W	34,65N,23W	Grundy	Mercer	x	x	*[B]*
W. Fk. Locust Cr.	C	17.0	Hwy. 6	33,64N,21W	Sullivan		x	x	*[B]*
Trib. to W. Fk. Lost Cr.	C	*[3.0]* **2.3**	Mouth	*[4,58N,31W]* **Willow Brook Lk**	DeKalb		x	x	*[B]*
Wamsley Cr.	C	1.5	Mouth	27,58N,30W	DeKalb		x	x	*[B]*
Wildcat Cr.	C	7.0	6,62N,32W	8,63N,33W	Gentry	Nodaway	x	x	*[B]*
Wilkerson Cr.	C	6.9	Mouth	07,52N,32W	Clay		x	x	*[B]*
Trib. to Willow Fk.	C	0.5	Mouth	27,45N,17W	Moniteau		x	x	*[B]*

IRR LWW AQL CLF CDF WBC SCR DWS IND

IRR-Irrigation
LWW-Livestock & Wildlife Watering
AQL-Protection of Warm Water Aquatic Life and Human Health—Fish Consumption
CLF-Cool Water Fishery
CDF-Cold Water Fishery
WBC-Whole Body Contact Recreation
SCR-Secondary Contact Recreation
DWS-Drinking Water Supply
IND-Industrial